



BPA Energy Efficiency Industrial New Opportunities Guide



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Introduction

The Bonneville Power Administration's (BPA) energy efficiency programs are continuously evolving to meet Public Power's share of energy savings targets laid out by the Northwest Power and Conservation Council's Power Plan. Strategically, BPA also uses energy efficiency to address future energy resource constraints in a cost-effective manner. To achieve these two goals, BPA periodically reviews program offerings.

This Industrial New Opportunities Guide is a resource that utilities can use to help identify measures, programs and opportunities that support their energy efficiency programs. For more information on the complete suite of Industrial sector program components and offerings, please consult the [BPA Implementation Manual](#).



Industrial Measures

The Industrial sector focuses on electrical energy savings achieved through fixed equipment, buildings, or complexes that manufacture or store goods. Public utilities serve more than 2,200 megawatts of industrial load in the region, making industrial sector users a vitally important factor for BPA's energy efficiency programs.

Energy Smart Industrial Program

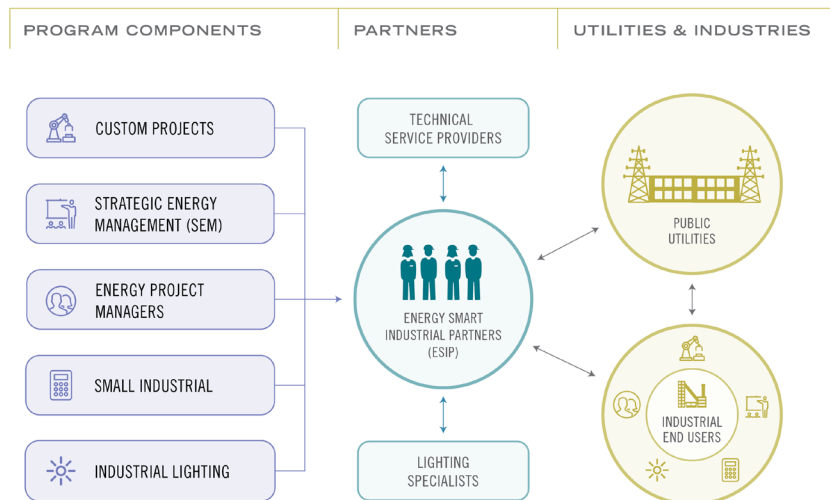
The Industrial sector offers one comprehensive third-party implemented program, Energy Smart Industrial (ESI) which is available to BPA's utility customers to help the region's industries achieve measurable and cost-effective energy savings. ESI provides services targeted at a diverse landscape of industrial facilities, project types and sizes, and technologies to utilities, end-users and contractors. Industries participating in the program include pulp and paper, food processing, wood products, high-tech manufacturing, water and wastewater treatment, cold storage, chemical processing, mining, and transportation and rail infrastructure.

BPA staff administer the ESI program and provide technical oversight. The ESI program partner, Cascade Energy, works with BPA and utility staff to implement the program, including market outreach, account planning, and project management from inception to completion. In addition, Evergreen Energy Partners is a team of lighting specialists provide industrial lighting project support, and ESI's pool of Technical Service Providers (TSPs) provide specialized expertise for facility scoping studies, custom project assessments, measurement and verification (M&V) studies, and strategic energy management (SEM) coaching.

The ESI program includes a portfolio of complementary program elements targeted at a diverse landscape of industrial end-users, project types and sizes, and technologies. Energy-efficiency projects range from traditional capital projects to trade ally-delivered measures to energy management projects.

Each utility has an assigned Energy Smart Industrial Partner (ESIP) who serves as a single point-of-contact for the utility and their industrial customers, and supports custom projects from inception to completion. ESIPs also provide technical expertise, ensure effective project-pipeline management, engage TSPs, resources, and develop custom project proposals, completion reports, and strategic energy management. Delivery of these program components also includes dedicated resources for quality control, safety, marketing and communications, and project tracking and reporting.

Verified savings achieved through the ESI program are eligible for Energy Efficiency Incentive (EEI) reimbursement. BPA's Energy Efficiency Implementation Manual provides additional details and official policies on incentive levels and funding requirements.



Sector Offerings

To drive energy savings in the Industrial sector, ESI offers support for various site-specific energy-efficiency projects, including large retrofits and new construction.

CUSTOM PROJECTS

ESI works closely with the industrial end-use customer to uncover energy savings opportunities. The ESIP then develops the Custom Project Proposal in BPA's Energy Efficiency Tracking System (BEETS), which includes the estimated energy savings, project costs, and a custom Measurement and Verification (M&V) Plan. The utility will review and submit the proposal to BPA for review and approval.

Once installed, a post-implementation M&V study is performed by ESI to calculate verified energy savings. A Custom Project Completion Report, which documents the verified energy savings, project implementation costs and performance incentives, is developed in BEETS and submitted to the utility for review and final submission to BPA for review and approval. The final payment from BPA to the utility is based on acceptance of the project's Completion Report.

Any measure not featured on the Unit Energy Savings (UES) Measures List, or that does not have an associated calculator in the online [Document Library](#), can be submitted as a custom project. Individual custom projects must meet the cost-effectiveness requirements described in Section 4.3 Custom Projects General Requirements in the current [BPA Implementation Manual](#).

STRATEGIC ENERGY MANAGEMENT

Industrial customers can achieve significant reductions in energy consumption without the cost of major capital upgrades. BPA's Strategic Energy Management (SEM) measure helps industries reduce energy intensity by using a peer, cohort-driven approach to energy management and by providing organizational training, technical support for operations and maintenance (O&M) improvements, and energy monitoring and reporting tools.

SEM promotes implementation of a structured, sustainable energy program that delivers consistent long-term results. Organizations successful in SEM have (1) clear support from upper management; (2) a designated energy champion to lead implementation; (3) are willing to consider new methods and procedures to improve energy performance and reduce costs.

ESI offers several SEM cohorts throughout the region that focus on wastewater and other industries, and are always considering opportunities to develop new SEM cohorts. The [Implementation Manual](#) (see Section 10.3.2 Strategic Energy Management) provides the details on this measure and all SEM participants are required to follow the BPA [Commercial and Industrial SEM Measurement and Verification Reference Guide](#), which is based on industry best practices.

CASE STUDY

[City of Kennewick](#): Wastewater treatment plant saved 2.7 million kWh and \$150,000 through 2018.



ENERGY PROJECT MANAGER

Large industrial customers often lack the staffing resources to identify, develop and implement energy-saving opportunities. The Energy Project Manager (EPM) is structured process to help those customers overcome this resource barrier by providing an additional co-funded payment for verified energy savings (e.g., payments and savings associated with UES, nonresidential lighting, SEM and custom projects that have been completed and approved by BPA).

LIGHTING

BPA's nonresidential lighting measures are offered via the BPA Lighting Calculator, a Microsoft Excel-based, site-specific tool. The lighting calculator offers a robust selection of deemed and calculated incentives for interior and exterior LED lighting.

The current version(s) of the lighting calculator are listed in the online [Document Library](#) and the [Commercial/Industrial Lighting](#) webpage. The lighting calculator can be customized by BPA's customers to include utility logos, utility-specific rates used to determine project payback/return on investment and customized incentives.

For assistance, please contact the BPA lighting team at lighting@bpa.gov or the assigned ESIP.

SMALL INDUSTRIAL

BPA offers a number of prescriptive measures that target small industrial customers and projects, including small compressed air systems, water system leak abatement, and efficient pumps (see BPA [Implementation Manual](#) Section 8.7.5 Efficient Pumps). Each of these measures is supported by a calculator that greatly simplifies the energy savings and incentive calculations. While these offers are available outside the ESI program, the team is on-hand to support utilities and end-users with the completion of these measures.

BPA also offers incentives for variable frequency drives for fans and pumps (see BPA [Implementation Manual](#) Section 10.4.1 Variable Frequency Drives for Fans in Potato and Onion Storage Facilities and Section 8.7.6 Variable Frequency Drives for Pumps).

CASE STUDIES

[Boise Cascade](#): Saving more than \$24,000 annually with air compressor energy upgrades.

[Pasco Processing](#): Refrigeration energy improvements are saving Pasco Processing more than 1.7 million kilowatt-hours and \$60,000 annually.



Sector Savings Overview

INDUSTRIAL SAVINGS ACHIEVEMENT BY MEASURE TYPE

| MEASURE TYPES | TYPICAL CONTRIBUTION |
|----------------------|----------------------|
| Custom | 65% |
| Lighting | 20% |
| Energy Management | 14% |
| Other (Deemed, etc.) | 1% |

TOP FIVE END USES TARGETED FOR CUSTOM PROJECTS

1. Process Loads*
2. Refrigeration
3. Motors/Drives
4. Compressed Air
5. HVAC

*The Process Load end use will vary significantly depending on the industry and product being produced at each facility. Examples include pulping machines at a paper mill or aeration pumps at a wastewater treatment plant.



Resources

The following resources are available to help utilities optimize their working relationships with BPA, program operations and other personnel to support end-users in their efforts to achieve better energy efficiency and savings.

MARKETING MATERIALS

The ESI team works with utilities to perform direct outreach that engages industrial end-users. The primary marketing materials used by the ESI team are case studies that showcase successful projects. ESI also offers two ways to recognize the achievements of program participants:

- **Big check ceremonies** may be available for significant projects or when large incentives are delivered. These ceremonies are planned in close collaboration between ESI, BPA and the local utility.
- **Project success posters** are developed to help provide highlights from completed projects. Posters can be laminated or framed, and made available to the industrial facility that may include a high-level project overview, showcase key achievements or avoided costs, and utility incentives received.



Shelton Sawmill

Energy Savings Projects 2020



Projects Implemented

Bakerville Dust Collector Fan VFD Upgrade
The 150 hp Bakerville Dust Collector Fan converts was installed for the Bakerville saw mill, which will reduce saws. Sawdust runs for three days, run continuously for two hours a day, five or six days a week. After the VFD, the fan will speed with excess utility and fluctuate to convey the sawdust to the cyclone for separation.

The programmable VFD provided the ability to adjust the dust collector fan speed depending on the number of saws being operating. This new level of control led to a 40% savings in electricity.

A Facility Scoping Audit, co-funded by Mission PUD 3 and Energy Smart Industrial, identified the savings opportunity. After fully scoping and developing the project, Mike Powell (Project) Shelton Electric/Mike Powell, installed and programmed the VFD.



221,766
kWh Annual Energy Savings



\$9,713
Annual Avoided Cost
(at \$0.044/kWh)



16+
Pacific Northwest Homes' Annual Energy Use




What ideas do you have to save energy?

CONTACT
Karl Miller, Communication Manager
Shelton PUD
800-460-6179
karl.miller@sheltonpud.org





Energy Project Manager (EPM)

Five Years of Success



14 Projects Implemented

EPM Highlights

Installed variable frequency drives on pumps
Pump projects include filtered water, wastewater, raw water, and cooling pumps.
3,941,739 kWh/year

Installed variable frequency drives on fans
Fan projects include fabric and bag dust dryer fans.
1,342,124 kWh/year

Upgraded agitators
Mixing/agitation projects include wastewater, bleach cell and HCl tank agitators.
1,883,200 kWh/year

Compressed air system tune-up
Three compressed air systems to reduce energy use.
774,275 kWh/year



\$293,000
Cosmo's Total Capital Project Cost



\$1,474,000
Total Value to Cosmo to Date



7,800,000+
kWh Annual Energy Savings

Cumulative Financial Benefit to Cosmo


| Year | EBP Outflowing | EBP Inflowing | Energy Cost Savings |
|------|----------------|---------------|---------------------|
| 2015 | \$360 K | | |
| 2016 | \$384 K | \$827 K | |
| 2017 | | \$1,377 K | |
| 2018 | | \$1,474 K | |
| 2019 | | | \$1,474 K |



What ideas do you have to save energy?


CONTACT
David Church, Energy Project Manager
David Church, works with an ESI Technical Service Provider





Darigold Sunnyside

Energy Savings Projects 2011-2019



Projects implemented

2013 Dry Milk Plant Expansion
Installed variable frequency drives (VFD) for improved process control on pumps, refrigeration, and fans.


2014 Refrigeration Plant Upgrade & Lighting
Installed compressor and refrigerant on ammonia refrigeration system for better control and updated lighting.

2014-2016 Refrigeration Operator Coaching
Energy Management Cabinet
Low cost operational opportunities to improve overall energy performance.


2014 Boiler Fan VFDs
Installed VFDs to optimize combustion control on the steam system.

2013 Condenser Fan VFDs
Installed VFDs for improved refrigeration performance.


2011 New Outdoor and Lighting
Upgraded outdoor plant for process safety, equipment and energy performance.




+12,180,000
kWh Annual Energy Savings



\$423,000
Annual Avoided Cost





\$644,000
Benton REA Performance Incentive



What ideas do you have to save energy?


CONTACT
Karl Miller, Senior ESI Energy Services
New Business, Darigold Technical Manager
New Projects, EnergySmartIndustrial.com
New Ideas, ESI Program Industry Manager





Tillamook County Creamery Association

Energy Savings Projects 2019



Projects Implemented


1. Installed Variable Frequency Drives (VFDs) on:

- Bleach Vacuum Pumps
- Steam Vacuum Pumps
- Compressor Fans


VFDs allow a motor to run at a slower speed. This allows for more precise control of the process. At the end of each drawing 25 hp at 50% speed may now only draw 10 hp at 70% speed.

2. Installed a Logic Control System on the South Refrigeration System
This control system optimizes the operation of the refrigeration system by allowing for greater control by plant technicians.


3. Designed and Installed Photo Eyes to Reduce Compressed Air Usage in Packaging
Photo eyes were installed on every station. When there is product on the packaging line, a timer will turn off compressed air once all product has passed. Compressed air is a very expensive utility. Reduction of compressed air usage will greatly save energy.




1,191,905
kWh Annual Energy Savings



\$63,000
Annual Avoided Cost




141
Pacific Northwest Homes' Annual Energy Use



What ideas do you have to save energy?

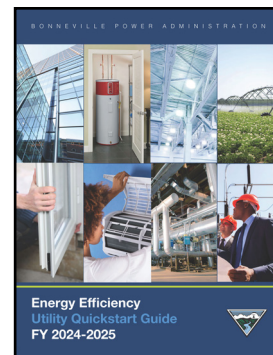
CONTACT
Gary Daugherty, Associate Process Engineer



GETTING STARTED WITH INDUSTRIAL PROGRAMS

Getting access to Industrial sector resources is as easy as reaching out to your ESIP. BPA hosts a quarterly meeting, the Utility Focus Group, for utilities interested in sharing best practices with peers working in the Industrial sector and BPA on [ESI program](#) offerings.

You can also consult the [Energy Efficiency Utility Quickstart Guide](#) for information including overviews, references, links to additional resources for common tasks, activities and responses to your potential questions.



CUSTOMER SERVICE

Energy Efficiency Representatives (EER) are accountable for building and maintaining customer relationships and act as the key means to support BPA's Energy Efficiency program communication with utilities. EERs lead the customer service team — composed of the EER, field engineer and the contracting officer's representative — for each utility. EERs work with all BPA staff, third-party staff and contract support to provide oversight, coordination, and execution of communication to and from utilities.

How do we work together? Your EER should be your first point of contact for any questions, comments, or concerns about BPA's Energy Efficiency program. If your EER doesn't know the answer, he or she will find it and get back to you, or put you in touch with the right person.

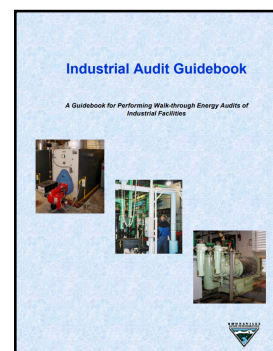


BPA INDUSTRIAL WEBSITE

BPA's [Industrial Sector](#) website provides a description of the ESI program components and fact sheets, access to BPA's industrial training YouTube channel, case studies and project success stories, Utility Focus Group presentations, and other resources.

ESI UTILITY PARTICIPANT LIST

The [ESI Utility Participant List](#) features all participating utilities and the ESIP assigned to support them.



BPA INDUSTRIAL AUDIT GUIDE

The [BPA Industrial Audit Guide](#) introduces technical and nontechnical audiences to common energy-efficiency opportunities identifiable during a walk-through audit of an industrial facility.



Measure Summary Table

The payment levels described in this table provide a summary only and can change. Complete, up-to-date details of the payment levels and associated requirements are included in the Industrial Sector section of the current BPA [Implementation Manual](#).

| 10.1 PAYMENT SUMMARY* | |
|--|---|
| PROGRAM COMPONENT OR MEASURE | PAYMENT |
| 10.2 Energy Smart Industrial | |
| 10.2.1 Industrial Custom Projects | See Section 4.1 Custom Projects Payment Rate |
| 10.2.2 Small Industrial Projects | See Section 4.1 Custom Projects Payment Rate |
| 10.2.3 BPA-Funded Technical Service Providers (TSP) | Paid by BPA through ESI Program third-party contract |
| 10.3 Energy Management | |
| 10.3.1 Energy Project Manager | Lesser of \$0.025 per kWh of verified energy savings, \$150,000 per site, or utility-specified cap per rate period |
| 10.3.2 Strategic Energy Management | |
| 10.3.2.1 Strategic Energy Management Legacy | Lesser of \$0.025 per kWh of SEM Verified Busbar Savings or utility-specified cap |
| 10.3.2.2 Multiyear Strategic Energy Management | Lesser of \$0.04 per kWh of SEM Annual Busbar Savings or utility-specified cap |
| 10.3.3 Performance Tracking System | Initial Installation: Lesser of PTS costs, \$15,000, or utility-specified cap Annual Maintenance: Lesser of PTS costs, \$10,000, or utility-specified cap, per two-year performance period |
| 10.4 Other Industrial Measures | |
| 10.4.1 Variable Frequency Drives for Fans in Potato and Onion Storage Facilities | \$200 per Horsepower |
| 10.4.2 Small Compressed Air Systems | Lesser of \$0.33 per kWh or 70% of project cost |
| 10.4.3 Water System Leak Abatement (BPA-Qualified) | Lesser of \$0.33 per kWh or 70% of project cost |
| Additional Multisector Opportunities | |
| Some Commercial and Agricultural Sector measures may be applicable to Industrial Sector projects. Measures eligible for installation in multiple sectors are identified where applicable in the body of the IM in the primary applicable sector. | |
| 8.3.1 Nonresidential Lighting – Lighting Calculators | See Lighting Calculator Series 6 |
| 8.7.5 Commercial Efficient Pumps | \$0.33 per kWh |
| 8.7.6 Commercial Variable Frequency Drive for Pumps (BPA-Qualified) | \$180 per Horsepower |